

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference P23741PCAU	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/AU2005/000153	International filing date (day/month/year) 8 February 2005	Priority date (day/month/year) 10 February 2004	
International Patent Classification (IPC) or national classification and IPC Int. Cl. <i>E02F 5/12</i> (2006.01) <i>E02D 17/12</i> (2006.01) <i>E02F 5/10</i> (2006.01)			
Applicant MITCHELL AUSTRALASIA PTY LTD et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 11 July 2005	Date of completion of this report 09 January 2006	11 JAN 2006
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer LEOPOLD FILIPOVIC Telephone No. (02) 6283 2105	

Box No. I Basis of the report1. With regard to the **language**, this report is based on:☒ The international application in the language in which it was filed☐ A translation of the international application into _____, which is the language of a translation furnished for the purposes of:☐ international search (under Rules 12.3(a) and 23.1 (b))☐ publication of the international application (under Rule 12.4(a))☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):☐ the international application as originally filed/furnished☒ the description:pages **1 and 4-6** as originally filed/furnishedpages* **2 and 3** received by this Authority on **11 July 2005** with the letter of **11 July 2005**

pages* received by this Authority on with the letter of

☒ the claims:

pages as originally filed/furnished

pages* as amended (together with any statement) under Article 19

pages* **7 and 8** received by this Authority on **11 July 2005** with the letter of **11 July 2005**

pages* received by this Authority on with the letter of

☒ the drawings:pages **1 and 2** as originally filed/furnished

pages* received by this Authority on with the letter of

pages* received by this Authority on with the letter of

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.3. ☐ The amendments have resulted in the cancellation of:☐ the description, pages☐ the claims, Nos.☐ the drawings, sheets/figs☐ the sequence listing (*specify*):☐ any table(s) related to the sequence listing (*specify*):4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).☐ the description, pages☐ the claims, Nos.☐ the drawings, sheets/figs☐ the sequence listing (*specify*):☐ any table(s) related to the sequence listing (*specify*):

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-8	YES
	Claims	NO
Inventive step (IS)	Claims 1-8	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-8	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The documents cited in the International Search Report have been considered for the purpose of this report.

None of the documents cited discloses all the features of the invention defined by claims 1-8. Therefore the subject matter of these claims is new and meets the requirements of Article 33(2) PCT with regard to novelty.

The claimed invention is not obvious in the light of any of the cited documents nor is it disclosed in any obvious combination of them. It is also considered that it would not be obvious to a person skilled in the art in the light of common general knowledge either by itself or in combination with any of these documents. Therefore the subject matter of claims 1-8 meets the requirements of Article 33(3) PCT with regard to inventive step.

and/or ensure the particulate material around and, if provided, above the pipeline (or the like), is uniformly packed such that significant gaps or cavities are not left in the material.

INTRODUCTION OF THE INVENTION

5 According to a first aspect of the invention, there is provided apparatus for compacting fine particulate earth or sand material around an elongate member laid in a trench, said apparatus including two disc members having a plurality of teeth like formations around its periphery and mount means for mounting said disc members spaced apart a distance greater than a width dimension of said
10 elongate member laid in the trench, said disc members being rotatable about a common axis whereby, in use, said disc members roll through said fine particulate material in said trench, said mount means including connection means enabling said apparatus to be connected to machinery for moving the apparatus along said trench.

15 Preferred features of the aforesaid aspect may be as defined in claims 2 to 4 annexed hereto, the subject matter of these claims being included in the disclosure of this specification by this reference thereto.

Conveniently and as further disclosed in this specification, equipment may be provided for spreading and levelling fine particulate earth or sand material
20 already deposited in the base region of a preformed trench, said equipment including a pair of laterally spaced side walls supported by skid members adapted, in use, to be positioned on a base surface of the trench, each said skid member extending generally in line with the direction of the trench and being located adjacent a side wall of the trench, said equipment including cross brace
25 means for maintaining spacing of said side walls during use, wall means closing a cross-sectional zone of said equipment between said side walls having a lower edge adapted to provide a level surface to said fine particulate material spread by said wall means, and connection means enabling said equipment to be connected to machinery for moving the equipment along said trench supported on
30 the base of said trench.

In accordance with a third aspect, the present invention provides a method of laying and embedding a pipeline or similar elongate member in a trench, said method involving the steps of:

- (i) depositing fine particulate bedding material into the trench for use as bedding under the elongate member;
- (ii) placing first apparatus in the trench, said first apparatus having spaced side wall means supported by support means resting on a base of said trench with said side wall means located adjacent respective side walls of said trench, said first apparatus also including a transverse wall member having a lower edge spaced upwardly from the base of said trench;
- (iii) moving said first apparatus along said trench while said transverse wall member spreads said fine particulate material and the lower edge of said transverse wall means provides a level surface for said fine particulate material;
- (iv) laying said elongate member on said level surface of said fine particulate material;
- (v) depositing a further quantity of fine particulate material into said trench such that said further quantity at least partially fills the space between said elongate member and the side walls of the trench;
- (vi) passing apparatus as defined in the preceding two paragraphs along said trench at least once with a respective said disc member positioned on either side of said elongate member, whereby each said disc member rolls through said fine particulate material and compacts said fine particulate material on either side of said elongate member; and
- (vii) back filling the trench.

Preferred features of this third aspect may be as defined in claims 11 to 14 annexed hereto, the subject matter of these claims being included in the disclosure of this specification by this reference thereto.

DESCRIPTION OF DRAWINGS

Preferred embodiments of this invention will now be described with reference to the accompanying drawings, in which:

Fig 1 is a schematic transverse view of a compactor apparatus according to one aspect of the present invention in a position of use within a trench;

Fig 2 is a schematic side view of the compactor apparatus shown in Fig 1;

Fig 3 is a side view of preferred spreading and levelling apparatus according to a second aspect of the present invention;

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Apparatus for compacting fine particulate earth or sand material around an elongate member laid in a trench, said apparatus including two disc members having a plurality of teeth like formations around its periphery and mount means
5 for mounting said disc members spaced apart a distance greater than a width dimension of said elongate member laid in the trench, said disc members being rotatable about a common axis whereby, in use, said disc members roll through said fine particulate material in said trench, said mount means including connection means enabling said apparatus to be connected to machinery for
10 moving the apparatus along said trench.
2. Apparatus according to claim 1 wherein said mount means includes a shaft interconnecting said disc members.
3. Apparatus according to claim 2 wherein the spacing distance between said disc members is selectably adjustable.
- 15 4. Apparatus according to any one of claims 1 to 3 wherein said teeth like formations have a square or rectangular shape.
5. A method of laying and embedding a pipeline or similar elongate member in a trench, said method involving the steps of:
 - (i) depositing fine particulate bedding material into the trench for use as
20 bedding under the elongate member;
 - (ii) placing first apparatus in the trench, said first apparatus having spaced side wall means supported by support means resting on a base of said trench with said side wall means located adjacent respective side walls of said trench, said first apparatus also including a transverse wall member
25 having a lower edge spaced upwardly from the base of said trench;
 - (iii) moving said first apparatus along said trench while said transverse wall member spreads said fine particulate material and the lower edge of said transverse wall means provides a level surface for said fine particulate material;

- (iv) laying said elongate member on said level surface of said fine particulate material;
- (v) depositing a further quantity of fine particulate material into said trench such that said further quantity at least partially fills the space between said elongate member and the side walls of the trench;
- 5 (vi) passing apparatus according to any one of claims 1 to 4 along said trench at least once with a respective said disc member positioned on either side of said elongate member, whereby each said disc member rolls through said fine particulate material and compacts said fine particulate material on either side of said elongate member; and
- 10 (vii) back filling the trench.

6. A method according to claim 5 wherein the trench is back filled with previously excavated material from the trench.

7. A method according to claim 5 or claim 6 wherein the fine particulate material is provided to the trench site from a remote source.

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8. A method according to claim 7 wherein the second apparatus is passed along said trench only once.